

EXECUTIVE SUMMARY



Comparative Analysis of the Cambridge IGCSE Mathematics (0580) Extended Tier and the SAT Math Test



The Cambridge IGCSE Mathematics (0580) Extended tier shows substantial alignment with the skills, content, and demand of the SAT Math Test. For example, Ecctis found alignment between the skills and knowledge needed to achieve an A in Cambridge IGCSE Mathematics (0580) Extended and a score of 700-800 on the SAT Math Test.

Context

Cambridge Assessment International Education (Cambridge) is a not-for-profit organisation operating in 160 countries and across nine world regions.¹ Cambridge offers international qualifications spanning from primary to pre-university years, each offered at one of the four stages of the Cambridge Pathway: Primary, Lower Secondary, Upper Secondary, and Advanced.

In 2022, a joint study by Cambridge and Arizona State University found that IGCSE Mathematics is a good indicator of college readiness and first-year performance.² In this

¹ Cambridge. (2023). *About us. What we do.* Available from: <https://www.cambridgeinternational.org/about-us/what-we-do/>

² CISION. PR Newswire. (2023). *Study Finds that Cambridge International Students Enrolled at Arizona State University Show Strong Performance Across College Readiness Metrics.* Available from: <https://www.prnewswire.com/news-releases/study-finds-that-cambridge-international-students-enrolled-at->

context, Ecctis was commissioned by Cambridge to undertake an in-depth mapping of the IGCSE Mathematics (0580) assessment against the College Board's SAT Math Test.³ The study identified key similarities and differences in assessment structure, skills, content, and demand, before making grade comparisons between the two assessments. The study focused on the 2023/24 IGCSE syllabus and the paper-based SAT Math Test.

This Executive Summary relates to the findings for the **Extended tier** of IGCSE Mathematics (0580). Some findings of the wider study are different for the Core tier – these are detailed in the full report and in a distinct Executive Summary.

Summary

The IGCSE Mathematics (0580) Extended and SAT Math Test have clear points of alignment in their skills, content, and demand. The below SAT score ranges were identified as the most accurate comparisons for the following selected IGCSE Mathematics (0580) Extended grades:⁴

IGCSE Mathematics (0580) Extended grade	SAT Math Test score
A	700-800
B	600-690
C	500-590
E*	300-390*

*The same result was found for the IGCSE Mathematics (0580) Core tier.

Overall, the grade comparison analysis indicated that:

- Candidates who achieve a high grade on the IGCSE Mathematics (0580) Extended demonstrate comparable skills and knowledge to those reaching the top score ranges of the SAT Math Test.
- Candidates achieving a grade C on the IGCSE Mathematics (0580) Extended demonstrate comparable skills and knowledge to those required to meet the SAT Math Test's 'Benchmark for College and Career Readiness'.⁵

Methodological approach

Ecctis applied a bespoke methodology to undertake a comparative analysis of the IGCSE Mathematics (0580) and SAT Math Test. The methodology included a comprehensive mapping method for skills and content, which was complemented by an assessment sample review. To assess item demand, Ecctis used an expert panel approach, whereby each expert⁶ conducted an independent review of items from an assessment sample and subsequently took part in a panel to discuss and reach a consensus on the judgements.

[arizona-state-university-show-strong-performance-across-college-readiness-metrics-301600183.html](https://www.cambridgeinternational.org/Images/655480-key-findings-asu-enrollment-and-outcomes.pdf); Patelis, T., Chi, K. (2021). *Cambridge International Performance Indicates College Readiness. Cambridge IGCSE Performance and First Year Performance at Arizona State University*. Available from: <https://www.cambridgeinternational.org/Images/655480-key-findings-asu-enrollment-and-outcomes.pdf>

³ College Board. (2023). *SAT Suite of Assessments*. SAT. Available from: <https://satsuite.collegeboard.org/sat>

⁴ The SAT scores range from 200-800 and the IGCSE Mathematics (0580) Extended grades range from E to A*.

⁵ This is a score of 530, as determined by the College Board. [Benchmarks – SAT Suite | College Board](#)

⁶ Experts consisted of individuals with diverse mathematics teaching and mathematics curriculum review experience at appropriate levels and in international contexts.

To undertake the grade comparisons, Ecctis drew upon grade distribution data and used an assessment sample to develop 'grade profiles'. These grade profiles estimated the minimum knowledge and skills required to achieve specific grades/scores, enabling a comparison between IGCSE Mathematics (0580) grades and SAT Math Test scores.

Findings of Comparative Analysis

Assessment structure

Analysis of the specifications found the following key differences between the IGCSE Mathematics (0580) and SAT Math Test:

Key differences	
IGCSE Mathematics (0580)	SAT Math Test
<ul style="list-style-type: none"> Offers Core or Extended tiers Longer duration and more questions Allows calculators throughout* Uses free-response questions (short-answer and structured) 	<ul style="list-style-type: none"> Non-tiered Shorter duration and fewer questions Has a non-calculator section* Uses multiple-choice questions and 'grid-ins'

*this will change in future assessments – see final section.

Overall, the assessments differ significantly in their structure and features.

Skills

Analysis of test specifications and assessment samples found the following similarities and differences in the skills that IGCSE Mathematics (0580) Extended and SAT Math Test assess:

Key similarities	Key differences
<ul style="list-style-type: none"> Both place a strong emphasis on problem-solving Both also assess: <ul style="list-style-type: none"> Knowledge and comprehension Interpretation Logical reasoning Use of technology 	<ul style="list-style-type: none"> IGCSE Mathematics (0580) places a significantly stronger emphasis on communication of mathematics The SAT Math Test places more emphasis on efficiency and making use of algebraic structure in problem-solving

Overall, the IGCSE Mathematics (0580) and SAT Math Test assess similar skills, though IGCSE places a significantly stronger emphasis on assessing mathematical communication.

Content

Analysis of specifications and assessment samples found the following similarities and differences in the content of IGCSE Mathematics (0580) Extended and the SAT Math Test:

Key similarities	Key differences
<ul style="list-style-type: none"> Assessments cover a similar breadth and depth of content Algebra is a significant content area and is covered in-depth Assessments feature important topics for further mathematics study, such as functions Considerable topic-level alignment between assessments A similar number of questions on the assessments target algebra 	<ul style="list-style-type: none"> Some differences in topics covered Different concepts are sometimes covered within topics

IGCSE Mathematics (0580) Extended and SAT Math Test share substantial similarities in terms of content covered and demonstrate a similar breadth and depth of content.

Demand

An assessment sample analysis of IGCSE Mathematics (0580) Extended and the SAT Math Test found the following key similarities and differences regarding question demand:

Key similarities	Key differences
<ul style="list-style-type: none"> Assessments are comprised of mostly medium and high demand questions High demand questions are present across various topics 	<ul style="list-style-type: none"> IGCSE Extended has a higher proportion of high and outstanding demand questions SAT Math Test has a higher proportion of medium and medium-high demand questions IGCSE Extended emphasises problem-solving requiring an extended strategy SAT Math Test uses complex contexts

Both assessments similarly challenge students by including few questions of low demand, though the IGCSE Mathematics (0580) Extended features a higher proportion of high demand questions. In addition to question demand, other factors influencing overall demand were also identified and discussed in the study, including:

Other key factors	
IGCSE Mathematics (0580)	SAT Math Test
<ul style="list-style-type: none"> Awarding of partial marks Younger cohort – typically 14-16 years old 	<ul style="list-style-type: none"> Use of multiple-choice questions All questions being worth one mark High proportion of assessment completion required to get high scores Short average time per question Older cohort – typically 16-18 years old

Future versions of assessment

A light-touch review of the IGCSE Mathematics (0580) 2025-27 assessments and digital SAT Math Test identified the following significant changes to each of the tests:

Key changes	
IGCSE Mathematics (0580)	Digital SAT Math Test
<ul style="list-style-type: none"> Introduction of a non-calculator paper, worth 50% of assessment overall Provision of formulae list Small changes to wording of assessment objectives Small changes to content, with some sub-topics being added and some removed 	<ul style="list-style-type: none"> Move to digital format, rather than paper-based Calculators allowed throughout test Introduction of adaptive testing Shorter duration Increased proportion of algebra, geometry, and trigonometry in the test Decreased proportion of 'Problem Solving and Data Analysis' content in the test Reduced average length of in-context questions Removal of complex numbers

There will be significant changes to the structure of both assessments. The SAT Math Test will also have significant changes to its format and proportions of assessed content areas.